Practice: 367 - Roofs and Covers

Scenario: #1 - Timber and Steel Sheet Roof

Scenario Description:

A timber framed building with a 29 gage corrugated sheet metal roof and supporting foundation is required by the engineering design. Agricultural wastes such as animal mortality and poultry litter are stored on concrete and earthen surfaces under the roof. Excess precipitation can cause premature filling of storages, interfere with composting or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. To be used in conjunction with waste management facilities, and typically installed over an approved Animal Mortality Facility (316) or Composting Facility (317).
Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve an existing or planned system. Agricultural wastes such as animal mortality and poultry litter are stored on concrete and earthen surfaces under the roof. Excess precipitation can cause premature filling of storages, interfere with composting or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

After Situation:

A timber framed building with a 29 gage corrugated sheet metal roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 930 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of Building

Scenario Unit: Square Foot

Scenario Typical Size: 930

Scenario Cost: $13,066.50 **Scenario Cost/Unit:** $14.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials						
Roof, Post Frame Building , less than 30' wide	1672	Post Frame Building, no sides, - less than 30' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Foot	$14.05	930	$13,066.50

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Scenario: #2 - Steel Frame and Roof

Scenario Description:

A steel framed building with a 29 gage corrugated sheet metal roof and steel trusses and truss supports is required by the engineering design. Agricultural wastes such as manure, animal mortality and poultry litter are stored on concrete and earthen surfaces under the roof. Excess precipitation can cause premature filling of storages, interfere with composting or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. To be used in conjunction with waste management facilities, and typically installed over an approved Waste Storage Facility (313).
Associated practices includes Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve an existing or planned system. Agricultural wastes such as animal mortality and poultry litter are stored on concrete and earthen surfaces uunder the roof. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

After Situation:

A steel framed building with a 29 gage corrugated sheet metal roof and steel trusses and truss supports. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 2,600 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of Building

Scenario Unit: Square Foot

Scenario Typical Size: 2,600

Scenario Cost: $14,040.00 **Scenario Cost/Unit:** $5.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials						
Roof, Post Frame Building, 30' to 60' wide	1676	Post Frame Building, no sides, - 30' to 60' width. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Foot	$5.40	2600	$14,040.00

Practice: 367 - Roofs and Covers

Scenario: #5 - Flexible Membrane Cover

Scenario Description:

A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Cover will exclude precipitation and/or capture biogas for controlled release for flaring or anaerobic digestion.

Associated practices include Waste Storage Facility (313), Waste Treatment Lagoon (359), Anaerobic Digester (366), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), Pumping Plant (533), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage or treatment lagoon will improve the management of an existing or planned system, capture and controlled release or flaring of emissions from an existing or planned agricultural waste storage to improve air quality, and/or biogas production and capture for energy use are part of the existing or planned animal waste management system.

After Situation:

A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester).

Scenario Feature Measure: Surface of Membrane

Scenario Unit: Square Foot

Scenario Typical Size: 10,000

Scenario Cost: $73,750.53 **Scenario Cost/Unit:** $7.38

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	$47.65	16	$762.40
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$23.61	16	$377.76
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$25.07	16	$401.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$20.15	16	$322.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$18.11	48	$869.28
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$5.90	12000	$70,800.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$217.57	1	$217.57